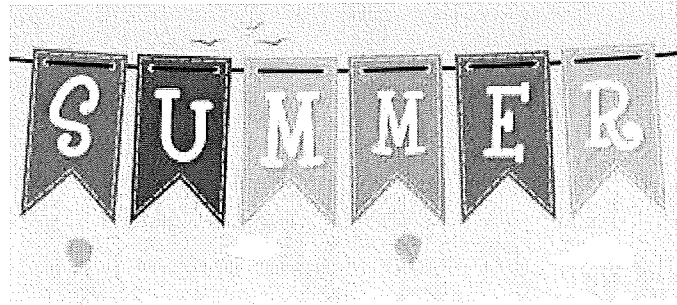


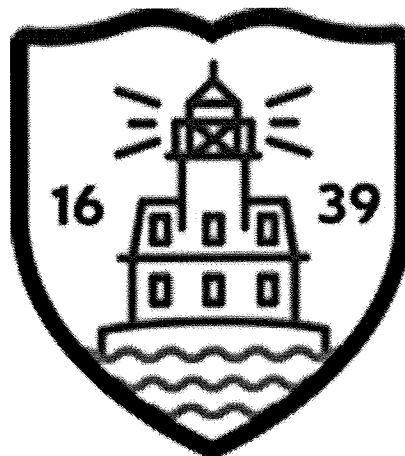
# Fairfield Public Schools



## Math Packet

For

Students Entering Sixth Grade



NAME \_\_\_\_\_



DATE \_\_\_\_\_

## Prime & Composite Numbers

Use the following information to help solve the problems below.

A prime number has only two factors: itself and 1.	A composite number has more than two factors.	The number 1 is neither prime nor composite.															
Number: 3 1 <table style="display: inline-table; vertical-align: middle;"><tr><td style="border: 1px solid black; width: 15px; height: 15px;"></td><td style="border: 1px solid black; width: 15px; height: 15px;"></td><td style="border: 1px solid black; width: 15px; height: 15px;"></td></tr></table>				Number 6 2 <table style="display: inline-table; vertical-align: middle;"><tr><td style="border: 1px solid black; width: 15px; height: 15px;"></td><td style="border: 1px solid black; width: 15px; height: 15px;"></td><td style="border: 1px solid black; width: 15px; height: 15px;"></td></tr><tr><td style="border: 1px solid black; width: 15px; height: 15px;"></td><td style="border: 1px solid black; width: 15px; height: 15px;"></td><td style="border: 1px solid black; width: 15px; height: 15px;"></td></tr></table> 1 <table style="display: inline-table; vertical-align: middle;"><tr><td style="border: 1px solid black; width: 15px; height: 15px;"></td><td style="border: 1px solid black; width: 15px; height: 15px;"></td><td style="border: 1px solid black; width: 15px; height: 15px;"></td><td style="border: 1px solid black; width: 15px; height: 15px;"></td><td style="border: 1px solid black; width: 15px; height: 15px;"></td></tr></table>												Number: 1 1 <table style="display: inline-table; vertical-align: middle;"><tr><td style="border: 1px solid black; width: 15px; height: 15px;"></td></tr></table>	

**1** For each number, circle prime or composite. Then list all of its factors.

Number	Circle one.	List all of the factors.
<b>example</b> 8	prime <u>composite</u>	1, 2, 4, 8
<b>a</b> 5	prime    composite	
<b>b</b> 16	prime    composite	
<b>c</b> 27	prime    composite	
<b>d</b> 31	prime    composite	
<b>e</b> 36	prime    composite	
 <b>f</b> 108	prime    composite	
 <b>g</b> 126	prime    composite	

**2** Julia says that prime numbers have to be odd and composite numbers have to be even. Is she correct? Explain how you know.

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## Understanding & Using Number Properties

If you are adding or multiplying, you can change the order of the numbers or the way they are grouped to make the calculations easier. The three properties below can make mental math easier.

Commutative Property	Associative Property	Distributive Property
Changing the order of two numbers or numerical expressions when you add or multiply does not change the answer.	Changing the way you group three numbers or numerical expressions when you add or multiply does not change the answer.	You can break a number apart, multiply each part separately, and then add the products. You will still get the same answer.
$5 + 2 = 2 + 5$ $5 \times 2 = 2 \times 5$	$(38 \times 4) \times 25 = 38 \times (4 \times 25)$ $= 38 \times 100$ $= 3,800$	$6 \times 13 = 6 \times (10 + 3)$ $= 6 \times 10 + 6 \times 3$ $= 60 + 18$ $= 78$

1 For each problem below:

- Write it a different way so it's easier to solve in your head.
- Solve it and write the answer.
- Circle C if you switched the order of the numbers.
- Circle A if you grouped the numbers in a different way.
- Circle D if you broke the number apart and multiplied one part at a time.
- You may need to circle more than one property.

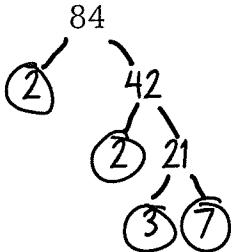
Problem	Rewrite	Answer	Property
<b>ex</b> $(70 + 469) + 30$	$(70 + 30) + 469$	569	C A D
<b>a</b> $(69 + 45) + 55$			C A D
<b>b</b> $4 \times 32$			C A D
<b>c</b> $4 \times (16 \times 25)$			C A D
<b>d</b> $(250 + 86) + 50$			C A D

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## More Prime Factorization

1 Use a factor tree to find the prime factorization of each number below.

<p><b>ex</b></p>  <p><math>84 = 2 \times 2 \times 3 \times 7</math></p>	<p><b>a</b></p> <p>96</p>	<p><b>b</b></p> <p>72</p>
--	---------------------------	---------------------------

2 Use the prime factors above to complete the sentences below. Fill in the circle or circles for each one.

**a** 12 is a factor of:  84  96  72

**b** 4 is a factor of:  84  96  72

**c** 8 is a factor of:  84  96  72

**d** 24 is a factor of:  84  96  72

**3a** If you know that 12 is a factor of a certain number, what else must be true about that number?

It is prime.

It is even.

It is greater than 40.

It is divisible by 9.

**b** Explain your answer to part a.

4 If you know that 10 is a factor of a certain number, what other numbers can you be certain are also factors of that number?

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## Multiplication Estimate & Check

1 Think about rounding to estimate the answers to the problems below. Then rewrite each problem vertically and solve it using the partial products method. Check your answer against your estimate to make sure that it is reasonable.

Problem	<b>ex</b> $63 \times 21$	<b>a</b> $42 \times 37$	<b>b</b> $73 \times 26$
Estimate	$60 \times 20 = 1,200$		
Solution	$\begin{array}{r} 63 \\ \times 21 \\ \hline 20 \times 60 = 1,200 \\ 20 \times 3 = 60 \\ 1 \times 60 = 60 \\ 1 \times 3 = + 3 \\ \hline 1,323 \end{array}$		
Problem	<b>c</b> $33 \times 19$	<b>d</b> $84 \times 38$	<b>e</b> $56 \times 44$
Estimate			
Solution			



### CHALLENGE

2 Circle the two numbers whose product is 1,274

26

34

49

61

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## Using the Standard Multiplication Algorithm

1 Solve these multiplication problems.

$$\begin{array}{r} 80 \\ \times 30 \\ \hline \end{array}$$

$$\begin{array}{r} 80 \\ \times 40 \\ \hline \end{array}$$

$$\begin{array}{r} 90 \\ \times 30 \\ \hline \end{array}$$

$$\begin{array}{r} 90 \\ \times 40 \\ \hline \end{array}$$

$$\begin{array}{r} 100 \\ \times 30 \\ \hline \end{array}$$

$$\begin{array}{r} 100 \\ \times 40 \\ \hline \end{array}$$

2 Solve these multiplication problems using the standard algorithm. Use the answers above to help make sure your answers are reasonable.

<p><b>ex</b></p> $\begin{array}{r} \phantom{0} 84 \\ \phantom{0} \times 36 \\ \hline \phantom{0} 504 \\ + 2,520 \\ \hline 3,024 \end{array}$	<p><b>a</b></p> $\begin{array}{r} 79 \\ \times 26 \\ \hline \end{array}$
<p><b>b</b></p> $\begin{array}{r} 86 \\ \times 32 \\ \hline \end{array}$	<p><b>c</b></p> $\begin{array}{r} 92 \\ \times 37 \\ \hline \end{array}$
<p><b>d</b></p> $\begin{array}{r} 82 \\ \times 43 \\ \hline \end{array}$	<p><b>e</b></p> $\begin{array}{r} 98 \\ \times 29 \\ \hline \end{array}$

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## Using Basic Fact Strategies to Multiply Larger Numbers

Thinking about basic fact strategies and relationships between facts can help you multiply larger numbers too.

To multiply by	Strategy	Example
3	Double the number and add 1 more of that number.	$3 \times 16$ $2 \times 16 = 32$ $32 + 16 = 48$
5	Think of the number times 10. Then cut it in half.	$5 \times 16$ $10 \times 16 = 160$ $160 \div 2 = 80$
20	Think of the number times 10. Then double it.	$20 \times 16$ $10 \times 16 = 160$ $160 + 160 = 320$
30	Think of the number times 10. Double it. Then add them together.	$30 \times 16$ $10 \times 16 = 160$ $160 + 160 = 320$ $320 + 160 = 480$
15	Think of the number times 10. Cut it in half. Then add them together.	$15 \times 16$ $10 \times 16 = 160$ $160 \div 2 = 80$ $160 + 80 = 240$

**1** Complete the multiplication problems below. Use problems you have already solved to help solve other ones.

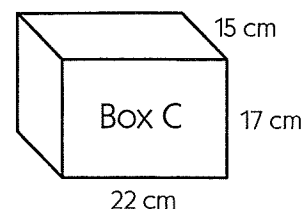
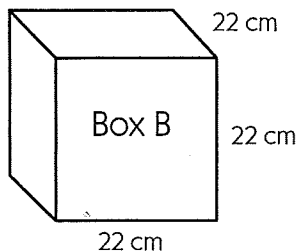
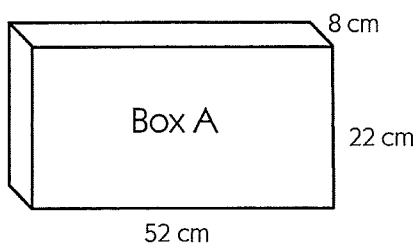
<b>a</b> $24 \times 1 =$ _____	<b>b</b> $32 \times 1 =$ _____	<b>c</b> $17 \times 1 =$ _____
$24 \times 2 =$ _____	$32 \times 2 =$ _____	$17 \times 2 =$ _____
$24 \times 3 =$ _____	$32 \times 3 =$ _____	$17 \times 3 =$ _____
$24 \times 10 =$ _____	$32 \times 10 =$ _____	$17 \times 10 =$ _____
$24 \times 5 =$ _____	$32 \times 5 =$ _____	$17 \times 5 =$ _____
$24 \times 20 =$ _____	$32 \times 20 =$ _____	$17 \times 20 =$ _____
$24 \times 30 =$ _____	$32 \times 30 =$ _____	$17 \times 30 =$ _____
$24 \times 15 =$ _____	$32 \times 15 =$ _____	$17 \times 15 =$ _____

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## Which Box Holds the Most?

**1** Ebony's cousin Jada is away at college this year. Ebony wants to send her a package with some candy in it. She has the three boxes shown below. Which box should she use if she wants to send Jada as much candy as possible?



- a** What do you need to know about the boxes in order to answer the question above?
- b** Solve the problem. Show all your work.

**2** Ebony wants to wrap the box in paper before she sends it to Jada. What is the surface area of the box you chose above? Show all your work.



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## More Fraction Story Problems

**1** Yesterday Carson threw away  $1\frac{1}{3}$  pounds of paper packaging. He threw away  $\frac{3}{4}$  of a pound of plastic packaging. Altogether, how many pounds of packaging did Carson throw away yesterday? Show all your work.

**2** Carmen ran  $1\frac{3}{8}$  miles yesterday. Her sister Lola ran  $2\frac{1}{4}$  miles yesterday. How much farther did Lola run than Carmen? Show all your work.



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## Multiplication & Division Review

1 Complete the following multiplication tables.

a

<b>×</b>	<b>2</b>	<b>9</b>	<b>6</b>	<b>5</b>	<b>7</b>	<b>20</b>	<b>40</b>	<b>30</b>
<b>60</b>	120							

b

<b>×</b>	<b>2</b>	<b>9</b>	<b>6</b>	<b>5</b>	<b>7</b>	<b>20</b>	<b>40</b>	<b>30</b>
<b>40</b>	80							

2 Complete the following division table.

<b>÷</b>	<b>1,200</b>	<b>900</b>	<b>60</b>	<b>210</b>	<b>1,500</b>	<b>1,800</b>	<b>270</b>	<b>2,400</b>
<b>30</b>	40							

3 Solve these multiplication problems using the standard algorithm.

$$\begin{array}{r}
 \overset{1}{\cancel{2}} 84 \\
 \times 36 \\
 \hline
 1,504 \\
 + 2,520 \\
 \hline
 3,024
 \end{array}$$

$$\begin{array}{r}
 58 \\
 \times 27 \\
 \hline
 \end{array}$$

$$\begin{array}{r}
 451 \\
 \times 32 \\
 \hline
 \end{array}$$

$$\begin{array}{r}
 256 \\
 \times 33 \\
 \hline
 \end{array}$$

$$\begin{array}{r}
 177 \\
 \times 49 \\
 \hline
 \end{array}$$

$$\begin{array}{r}
 305 \\
 \times 64 \\
 \hline
 \end{array}$$

$$\begin{array}{r}
 573 \\
 \times 26 \\
 \hline
 \end{array}$$

$$\begin{array}{r}
 837 \\
 \times 86 \\
 \hline
 \end{array}$$

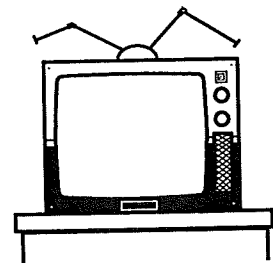
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## Time Problems

**1** Ms. Wilson wants to spend 15 minutes conferencing with each student in her class about their writing assignment. She has 30 minutes before school starts, 30 minutes after school ends, and one 45-minute study hall during the day. If she meets with students during all of those times, how many days will it take her to meet with her 30 students? Show all your work.

**2** Rhonda spends half an hour watching TV each weeknight and 2 hours each day on the weekends. How much time does she spend watching TV each week? Show all your work.



**3** Frank is supposed to practice his violin for at least 6 hours a week. He played for 30 minutes on Monday, for an hour on Wednesday and on Friday, and for 45 minutes on Thursday. He didn't play at all on Tuesday. How much does he need to practice this weekend to make it at least 6 hours of practicing this week? Show all your work.

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## Division Estimate & Check

Make a multiplication menu for each divisor. Complete the sentence to identify a range of reasonable answers. Then use long division to find the exact answer, including the remainder if there is one.

Problem	Multiplication Menu	Range of Reasonable Answers	Your Work	Exact Answer
<b>ex</b> $307 \div 19$	$19 \times 10 = 190$ $19 \times 20 = 380$ $19 \times 5 = 95$ $19 \times 2 = 38$	The answer will be less than <u>20</u> and greater than <u>10</u> .	$  \begin{array}{r}  19 \overline{) 307} \\  \underline{- 190} \\  117 \\  \underline{- 95} \\  22 \\  \underline{- 19} \\  3  \end{array}  $	16 r3
<b>1</b> $396 \div 17$		The answer will be less than _____ and greater than _____.		
<b>2</b> $275 \div 13$		The answer will be less than _____ and greater than _____.		

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## Finding Equivalent Fractions

1 Write two fractions that are equal to the fraction shown.

<b>ex</b> $\frac{3}{9} = \frac{1}{3}$ and $\frac{3}{9} = \frac{6}{18}$	<b>a</b> $\frac{9}{15} =$ and $\frac{9}{15} =$
<b>b</b> $\frac{4}{6} =$ and $\frac{4}{6} =$	<b>c</b> $\frac{15}{18} =$ and $\frac{15}{18} =$

2 Circle the fractions that are equal to the fraction shown. Use the space at right as a work space to do calculations if needed.

Fraction	Circle the fractions that are equal to the other fraction.
<b>ex</b> $\frac{1}{2}$	$\frac{4}{8}$ $\frac{3}{5}$ $\frac{2}{4}$ $\frac{7}{14}$ $\frac{5}{6}$
<b>a</b> $\frac{4}{12}$	$\frac{1}{3}$ $\frac{2}{10}$ $\frac{8}{24}$ $\frac{6}{14}$ $\frac{12}{36}$
<b>b</b> $\frac{3}{4}$	$\frac{6}{7}$ $\frac{6}{8}$ $\frac{9}{12}$ $\frac{15}{20}$ $\frac{30}{40}$
<b>c</b> $\frac{3}{15}$	$\frac{6}{30}$ $\frac{5}{17}$ $\frac{1}{3}$ $\frac{1}{5}$ $\frac{9}{45}$

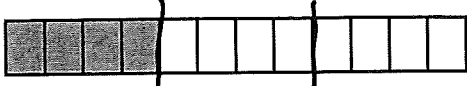
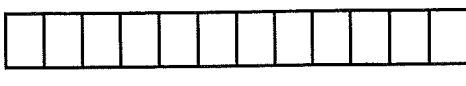
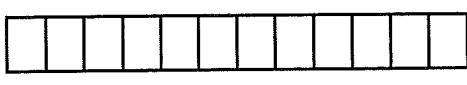

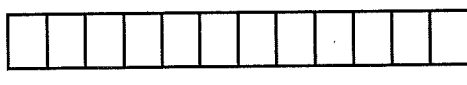

3 If you are given one fraction, what can you do to write other fractions that are equal to that fraction?

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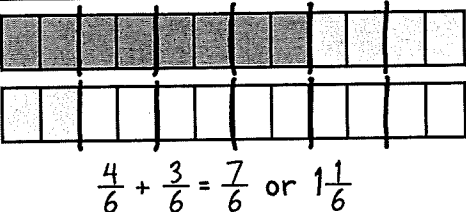
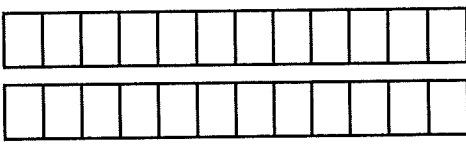
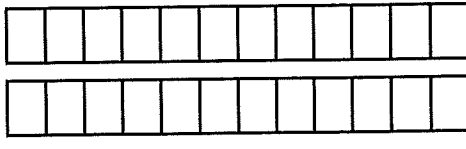
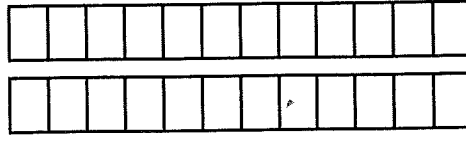
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# Adding Fractions

1 Each bar below is divided into 12 equal pieces. Show each fraction on a fraction bar.

<b>ex</b>		<b>a</b>	
<b>b</b>		<b>c</b>	
<b>d</b>		<b>e</b>	

2 Rewrite each pair of fractions so that they have the same denominator. Then use the fraction bar pictures to show their sum. Write an equation to show both fractions and their sum.

Fractions to Add	Rewrite with Common Denominator	Picture and Equation
<b>ex</b> $\frac{2}{3} + \frac{1}{2}$	$\frac{2}{3} + \frac{1}{2} = \frac{4}{6} + \frac{3}{6}$	 $\frac{4}{6} + \frac{3}{6} = \frac{7}{6}$ or $1\frac{1}{6}$
<b>a</b> $\frac{2}{3} + \frac{3}{4}$	$\frac{2}{3} + \frac{3}{4} =$	
<b>b</b> $\frac{1}{3} + \frac{5}{6}$	$\frac{1}{3} + \frac{5}{6} =$	
<b>c</b> $\frac{7}{12} + \frac{3}{4}$	$\frac{7}{12} + \frac{3}{4} =$	

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## Adding Fractions & Mixed Numbers

**1** Rewrite each fraction in simplest form by dividing the numerator and denominator by the greatest common factor. A fraction is in its simplest form when its numerator and denominator have no common factor other than 1. You do not have to show your work if you can do it in your head.

<b>ex</b> $\frac{9 \div 3}{15 \div 3} = \frac{3}{5}$	<b>a</b> $\frac{4 \div \quad}{6 \div \quad} = \frac{\quad}{\quad}$	<b>b</b> $\frac{12 \div \quad}{15 \div \quad} = \frac{\quad}{\quad}$
<b>c</b> $\frac{12 \div \quad}{18 \div \quad} = \frac{\quad}{\quad}$	<b>d</b> $\frac{8 \div \quad}{12 \div \quad} = \frac{\quad}{\quad}$	<b>e</b> $\frac{4 \div \quad}{12 \div \quad} = \frac{\quad}{\quad}$

**2** Rewrite each pair of fractions so they have the same denominator. Then find their sum. Sometimes, you will need to find the least common multiple. Sometimes you might be able to reduce each fraction to its simplest form to find a common denominator.

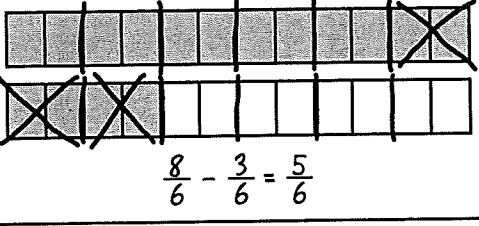
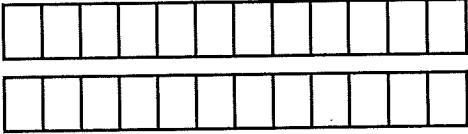
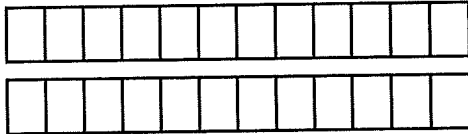
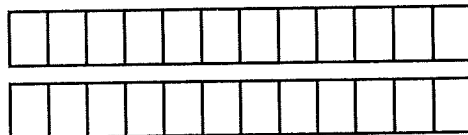
<b>ex a</b> $\frac{5}{8} + \frac{7}{12}$ ↓     ↓ $\frac{15}{24} + \frac{14}{24} = \frac{29}{24}$ and $\frac{29}{24} = 1\frac{5}{24}$	<b>ex b</b> $\frac{2}{6} + \frac{8}{12}$ ↓     ↓ $\frac{1}{3} + \frac{2}{3} = \frac{3}{3}$ and $\frac{3}{3} = 1$
<b>a</b> $\frac{3}{4} + \frac{2}{8}$	<b>b</b> $\frac{6}{8} + \frac{9}{12}$
<b>c</b> $3\frac{6}{12} + 4\frac{1}{2}$	<b>d</b> $1\frac{5}{8} + 2\frac{3}{4}$

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# Fraction Subtraction

1 Rewrite each pair of fractions so they have the same denominator. Then use the fraction bar pictures to show their difference. Write an equation to show both fractions and their difference.

Fractions	Rewrite with Common Denominator	Picture and Equation
<p><b>ex</b></p> $\frac{4}{3} - \frac{1}{2}$	$\frac{4}{3} - \frac{1}{2} = \frac{8}{6} - \frac{3}{6}$	 $\frac{8}{6} - \frac{3}{6} = \frac{5}{6}$
<p><b>a</b></p> $\frac{3}{4} - \frac{2}{3}$	$\frac{3}{4} - \frac{2}{3} =$	
<p><b>b</b></p> $\frac{5}{6} - \frac{1}{3}$	$\frac{5}{6} - \frac{1}{3} =$	
<p><b>c</b></p> $\frac{15}{12} - \frac{3}{4}$	$\frac{15}{12} - \frac{3}{4} =$	



## CHALLENGE

2 Add each pair of numbers.

**a**  $\frac{4}{12} + \frac{7}{15} =$

**b**  $463\frac{7}{12} + 129\frac{13}{36} =$



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## More Fraction Subtraction

**1** Rewrite each improper fraction as a mixed number.

**ex**  $\frac{16}{12} = 1\frac{4}{12}$

**a**  $\frac{12}{8} =$

**b**  $\frac{15}{6} =$

**c**  $\frac{17}{8} =$

**d**  $\frac{14}{3} =$

**2** Rewrite each mixed number as an improper fraction.

**ex**  $1\frac{2}{8} = \frac{10}{8}$

**a**  $1\frac{5}{12} =$

**b**  $2\frac{5}{6} =$

**c**  $3\frac{1}{4} =$

**d**  $4\frac{2}{3} =$

**3** Rewrite each pair of fractions so that they have the same denominator. Then find the difference. Sometimes, you will need to find the least common multiple. Sometimes you might be able to reduce each fraction to its simplest form to find a common denominator.

<p><b>ex a</b></p> $\begin{array}{r} \frac{5}{8} - \frac{7}{12} \\ \downarrow \quad \downarrow \\ \frac{15}{24} - \frac{14}{24} = \frac{1}{24} \end{array}$	<p><b>ex b</b></p> $\begin{array}{r} \frac{8}{6} - \frac{8}{12} \\ \downarrow \quad \downarrow \\ \frac{4}{3} - \frac{2}{3} = \frac{2}{3} \end{array}$
<p><b>a</b></p> $\frac{7}{4} - \frac{4}{8}$	<p><b>b</b></p> $\frac{15}{12} - \frac{3}{8}$
<p><b>c</b></p> $2\frac{3}{8} - 1\frac{1}{3}$	<p><b>d</b></p> $3\frac{5}{8} - 1\frac{3}{4}$

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## Decimal Addition & Subtraction

1 Fill in the missing digits below to make the inequalities true. There will be more than one correct way to fill in each missing digit.

<b>ex</b> $3 < 1.\underline{5}06 + 1.5$	<b>a</b> $0.705 + 1.\underline{\quad}98 < 2$
<b>b</b> $4 < 2.406 + 1.\underline{\quad}09$	<b>c</b> $1.620 + 1.\underline{\quad}82 > 3$

2 Complete the following addition problems.

$$\begin{array}{r} 3.034 \\ + 1.886 \\ \hline 4.920 \end{array}$$

$$\begin{array}{r} 12.32 \\ + 4.099 \\ \hline \end{array}$$

$$\begin{array}{r} 6.005 \\ + 12.243 \\ \hline \end{array}$$

$$\begin{array}{r} 17.28 \\ + 3.8 \\ \hline \end{array}$$

$$\begin{array}{r} 7.853 \\ + 3.629 \\ \hline \end{array}$$

$3.45 + 5.062 = \underline{\hspace{2cm}}$

$8.049 + 4.356 = \underline{\hspace{2cm}}$

3 Complete the following subtraction problems.

$$\begin{array}{r} 3.046 \\ - 1.273 \\ \hline 1.773 \end{array}$$

$$\begin{array}{r} 5.38 \\ - 2.4 \\ \hline \end{array}$$

$$\begin{array}{r} 4.263 \\ - 2.051 \\ \hline \end{array}$$

$$\begin{array}{r} 8.03 \\ - 3.485 \\ \hline \end{array}$$

$$\begin{array}{r} 12.238 \\ - 9.065 \\ \hline \end{array}$$

$15.204 - 8.039 = \underline{\hspace{2cm}}$

$13.006 - 12.058 = \underline{\hspace{2cm}}$

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## Decimal Story Problems

**1a** In the 2008 Beijing Summer Olympics, Jamaican runner Usain Bolt ran the 200 meter dash in 19.30 seconds, coming in first place and breaking the world record for that race. The runner who came in second, Churandy Martina, finished the race in 19.82 seconds. By how much did Bolt win the race? Show all your work.

**b** Did Bolt run the race more or less than a half-second faster than the second place finisher? Explain how you can tell.

**2a** In the 2008 Beijing Summer Olympics, Usain Bolt ran the 100-meter dash in 9.69 seconds. Is that less than half, exactly half, or more than half as long as it took him to run the 200-meter dash? Show all your work.

**b** Does your answer to part 2a make sense to you? Explain why or why not.

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## Fraction Estimate & Check

Before you solve each problem, look carefully at the fractions and write what you know about the sum or difference. Then find the exact sum or difference. Show all your work. If your answer is greater than 1, write it as a mixed number, not an improper fraction.

Problem	What You Know Before You Start	Show your work.	Exact Sum or Difference
<b>ex</b> $\frac{8}{3} + \frac{9}{12}$	The sum is more than 3.	$\frac{32}{12} + \frac{9}{12} = \frac{41}{12}$ and $\frac{41}{12} = 3\frac{5}{12}$	$3\frac{5}{12}$
<b>1</b> $\frac{4}{6} + \frac{8}{12}$			
<b>2</b> $\frac{12}{8} + \frac{3}{4}$			
<b>3</b> $\frac{3}{8} + \frac{8}{12}$			
<b>4</b> $\frac{10}{8} - \frac{9}{12}$			
<b>5</b> $\frac{5}{6} - \frac{3}{4}$			

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## Order of Operations Review

The order of operations tells you how to do calculations when there is more than one kind of operation.

Order of Operations	Example
	$20 - 12 \div (3 + 1)$
1. Anything inside parentheses	$20 - 12 \div (3 + 1) = 20 - 12 \div 4$
2. Multiplication and division from left to right	$20 - 12 \div 4 = 20 - 3$
3. Addition and subtraction from left to right	$20 - 3 = 17$

**1** Use the order of operations above to complete each equation. Show all your work.

<b>a</b> _____ = $463 - 180 \div (3 \times (2 + 3))$	<b>b</b> $(249 - 192) \div 3 \times 14 =$ _____
<b>c</b> _____ = $36 + 14 \times (182 - 164) \div 12$	<b>d</b> $(9 \div 3 + 213) - 72 \div 4 =$ _____

**2** Insert parentheses to make each equation true. Show all your work.

<b>a</b> $3 \times 9 + 18 + 36 \div 9 = 33$	<b>b</b> $2 = 140 \div 2 + 12 - 4 \times 2$
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## Reviewing Three Number Properties

If you are adding or multiplying, you can change the order of the numbers or the way they are grouped to make the calculations easier. The three properties below can make mental math easier.

Commutative Property	Associative Property	Distributive Property
Changing the order of two numbers or numerical expressions when you add or multiply does not change the answer.	Changing the way you group three numbers or numerical expressions when you add or multiply does not change the answer.	You can break a number apart, multiply each part separately, and then add the products. You will still get the same answer.
$5 + 2 = 2 + 5$ $5 \times 2 = 2 \times 5$	$(38 \times 4) \times 25 = 38 \times (4 \times 25)$ $= 38 \times 100$ $= 3,800$	$6 \times 13 = 6 \times (10 + 3)$ $= 6 \times 10 + 6 \times 3$ $= 60 + 18$ $= 78$

1 For each problem below:

- Write it a different way so it is easier to solve in your head.
- Solve it and write the answer.
- Circle C if you switched the order of the numbers.
- Circle A if you grouped the numbers in a different way.
- Circle D if you broke the number apart and multiplied one part at a time.
- You may need to circle more than one property.

Problem	Rewrite	Answer	Property
<b>ex</b> $(70 + 469) + 30$	$(70 + 30) + 469$	569	C A D
<b>a</b> $12 \times 23$			C A D
<b>b</b> $(50 \times 73) \times 2$			C A D
<b>c</b> $15 + (135 + 86)$			C A D
<b>d</b> $35 \times 8$			C A D
<b>e</b> $25 \times (4 \times 329)$			C A D
<b>f</b> $(34 \times 50) \times 20$			C A D

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## Variables & Expressions

Sometimes people use letters to represent unspecified amounts. Such letters are called *variables*. For example, if you worked for \$6 an hour, you would multiply the time you worked by 6 to find out what you earned. If we let  $t$  represent the time you worked, we could show the amount of money you earned with this expression.

$$6 \times t$$

When we say, “evaluate the expression when  $t = 3$ ,” we mean, “figure out how much money you would make if you worked for 3 hours.” To do this, substitute 3 for  $t$  and complete the calculation:

Evaluate the expression  $6 \times t$  when  $t = 3$ .

$6 \times 3 = 18$  This means you would earn \$18 if you worked for 3 hours at \$6 per hour.

**1** Evaluate the expression  $6 \times t$  when:

**a**  $t = 2$

**b**  $t = 4$

**c**  $t = 5$

**d**  $t = 8$

**2** How much money would you make if you worked 15 hours and earned \$6 per hour?

**3** Evaluate the following expressions when each variable has the value shown. Use order of operations when you need to.

**ex**  $4 + b$  when  $b = 10$

$$4 + 10 = 14$$

**a**  $4 + b$  when  $b = 23$

**b**  $4 + b$  when  $b = 103$

**c**  $3 \times n - 2$  when  $n = 2$

**d**  $3 \times n - 2$  when  $n = 4$

**e**  $2 \times k + 12$  when  $k = 7$

**f**  $2 \times k + 12$  when  $k = 10$

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## Cheetahs & Muffins

**1a** Isabel works at the city zoo. She is in charge of feeding the cheetahs. Each cheetah needs to eat 5 pounds of food each day. Which expression shows how much food the cheetahs will eat altogether each day? (The letter  $c$  stands for the number of cheetahs at the zoo.)

$5 + c$

$c - 5$

$5 \times c$

$c \div 5$

**b** There are 6 cheetahs at the zoo now. How much food do they eat each day? Show all your work.

**c** The zoo is thinking about getting some more cheetahs. Isabel can afford to buy 70 pounds of food each day. How many cheetahs would that feed? Show all your work.

**2a** Every weekend Clarice and her dad bake some muffins and give 8 of them to their neighbors for breakfast on Sunday. Which expression shows how many muffins they have left over for themselves each week? (The letter  $m$  stands for the number of muffins they baked.)

$8 + m$

$m - 8$

$8 \times m$

$m \div 8$

**b** If they baked 24 muffins last weekend, how many did they have left for themselves? Show all your work.

**c** If they wanted to have 12 muffins left for themselves, how many would they need to bake? Show all your work.





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## Adding Fractions with Different Denominators

Here is a quick way to add fractions with different denominators.

Original Problem	$\frac{3}{4} + \frac{5}{6}$
1. Multiply the denominators by each other to get a common denominator.	$4 \times 6 = 24$
2. Rewrite each fraction as an equivalent fraction with the common denominator.	$\frac{3 \times 6}{4 \times 6} = \frac{18}{24}$ $\frac{5 \times 4}{6 \times 4} = \frac{20}{24}$
3. Add the fractions.	$\frac{18}{24} + \frac{20}{24} = \frac{38}{24}$
4. Reduce the sum to lowest form and express as a mixed number if greater than 1.	$38 \div 24 = 1 \text{ R } 14$ $\frac{38}{24} = 1\frac{14}{24}$ $1\frac{14}{24} = 1\frac{7}{12}$

1 Follow the steps at left to add each pair of fractions.

**a**

$$\frac{1}{6} + \frac{7}{9}$$

**b**

$$\frac{5}{8} + \frac{11}{12}$$

**c**

$$\frac{3}{5} + \frac{4}{11}$$

**d**

$$\frac{10}{16} + \frac{5}{9}$$

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## Fraction Addition & Subtraction Review

1 Find the sum or the difference for each pair of fractions.

**a**  $\frac{5}{6} - \frac{2}{5} =$

**b**  $\frac{1}{3} + \frac{6}{7} =$

2 Annie ran  $\frac{5}{8}$  of a mile. Her sister Mabel ran  $\frac{7}{10}$  of a mile. Who ran farther and by exactly how much? Show all of your work.

3 Juan and his mom hiked  $\frac{3}{8}$  of a mile this morning and  $\frac{4}{5}$  of a mile this afternoon. How much did they hike today? Show all of your work.

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## Fraction Addition & Subtraction Story Problems

1 Find the sum or the difference for each pair of numbers.

**a**  $\frac{5}{14} + \frac{4}{5} =$

**b**  $\frac{7}{9} - \frac{4}{7} =$

2 George and his dad made some snack mix for their camping trip. To make it, they used 2 cups of mini pretzels,  $\frac{3}{4}$  cup of peanuts, and  $\frac{2}{3}$  cup of chocolate chips. How many cups of snack mix did they end up with? Show all of your work.

3 Lisa drank  $\frac{7}{16}$  of a bottle of water during the soccer game. Julianne drank  $\frac{2}{3}$  of a water bottle that was the same size as Lisa's. Who drank more water and by exactly how much?

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## Dante's Decision page 1 of 2

Dante wants to spend some of his allowance money, but he is having a hard time deciding what to buy. He loves baseball cards, packs of gum, and bouncy balls. Fill in the ratio tables and answer the questions to help Dante keep track of what he can buy.

- 1 Dante's favorite packs of baseball cards cost \$1.70 each. Fill in the table below to show the cost of different numbers of packs of baseball cards.

Packs of Baseball Cards	1	2	4	8	9	10	15	25
Cost	\$1.70							

- 2 Dante's favorite gum costs \$0.60 a pack. Fill in the table below to show the cost of different numbers of packs of gum.

Packs of Gum	1	2	5	9	10	19	20	25
Cost	\$0.60							

- 3 Bouncy balls come in packages that cost \$3.15 each. Fill in the table below to show the cost of different numbers of packs of bouncy balls.

Packs of Bouncy Balls	1	2	3	6	9	10	12	20
Cost	\$3.15							

- 4 Dante decided to spend only \$20.00 of his allowance and save the rest for later.
- Can he buy 12 packs of baseball cards? Why or why not?
  - Can he buy 30 packs of gum? Why or why not?
  - How much of the \$20.00 will he still have after he buys 5 packs of bouncy balls?

**Skills Review** page 2 of 2**4** Fill in the blanks.

**a**  $\frac{1}{2}$  of 84 = \_\_\_\_\_

**b**  $\frac{1}{4}$  of 84 = \_\_\_\_\_

**c**  $\frac{1}{8}$  of 84 = \_\_\_\_\_

**d**  $\frac{1}{2}$  of \_\_\_\_\_ = 62

**e**  $\frac{1}{4}$  of \_\_\_\_\_ = 31

**5** True or False?

**a**  $\frac{1}{4}$  of 28 =  $\frac{1}{8}$  of 14

**b**  $\frac{1}{8}$  of 32 =  $\frac{1}{4}$  of 16

**c**  $\frac{1}{2}$  of 56 =  $\frac{1}{4}$  of 28

**6** Add or subtract. Use the space below to show your work if necessary.

$\frac{1}{2} + \frac{5}{8} = \underline{\hspace{2cm}}$	$2\frac{1}{6} - \frac{7}{12} = \underline{\hspace{2cm}}$	$8\frac{3}{4} + 1\frac{5}{12} = \underline{\hspace{2cm}}$
$6.89 + 8.12 = \underline{\hspace{2cm}}$	$10.01 - 3.72 = \underline{\hspace{2cm}}$	$3.12 - 2.76 = \underline{\hspace{2cm}}$
$\frac{2}{3} + \underline{\hspace{2cm}} = 1\frac{4}{9}$	$4.08 - \underline{\hspace{2cm}} = 2.99$	$5\frac{1}{2} - \underline{\hspace{2cm}} = 2\frac{3}{4}$

**7 CHALLENGE** Randall has \$5.00 to spend on snacks at the movies. Use the table to figure out three snacks Randall can buy for \$5.00. Show your thinking. Is that the only combination of three snacks Randall can buy? How do you know?

Popcorn - small	\$2.75
Popcorn - medium	\$2.99
Popcorn - large	\$3.49
Cookie	\$2.25
Lemonade	\$1.19
Candy Bar	\$1.29
Granola Bar	\$0.89

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**Maria's Multiplication** page 2 of 2**Review****5** Finish the number pattern for the rule:  $2n + 1$ 

3, 5, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_

**6** Finish the number pattern for the rule:  $4n + 1$ 

5, 9, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_, \_\_\_\_\_

**7** What do you notice about the two number patterns you just completed? How are they similar? How are they different?**8** Multiply:

**a**  $8.7 \times 10 =$  \_\_\_\_\_

**b**  $8.7 \times 100 =$  \_\_\_\_\_

**c**  $8.7 \times 1,000 =$  \_\_\_\_\_

**d**  $8.7 \times 0.1 =$  \_\_\_\_\_

**e**  $8.7 \times 0.01 =$  \_\_\_\_\_

**f** Look at the zeroes and the decimal points in your answers. What do you notice?

